OPTICS

# Human Color Vision

➤ YOUR OPTICAL system for seeing colors works essentially like the mechanics for color television transmission, according to a new theory proposed by a University of California scientist.

Color perception, explains Dr. Gordon L. Walls, professor of physiological optics and optometry, is one of the most baffling aspects of human vision. His theory is the result of years of study of color blindness and color vision.

Most ideas about color perception hold that the eye contains separate receiving elements for color and for brightness.

Dr. Walls' evidence, however, indicates that color and brightness are received by the same elements in the eye but are transmitted to the brain over separate, "branched" pathways. In such an arrangement, brightness messages and color messages can be amplified independently along each one's own pathway.

Color television transmission requires essentially the same separation, independent amplification, and recombination of brightness and color signals as Dr. Walls' "branched pathways" theory would provide in the visual system.

"So it appears," Dr. Walls said, "that millions of years ago, nature found out that brightness and color messages could not be sent over the same routes and still have everything in proper balance for a perfect picture. Only recently, however, have the television engineers learned that."

Dr. Walls obtained much of his evidence from studies of women who are genetic carriers of color blindness. "Carrier women" theoretically should be normal, but sometimes are color blind in peculiar ways. Thus, for example, impaired brightness vision with no defects in color vision, and vice versa, are found.

Such cases can be explained, the California scientist believes, only by the presence of a branching system and transmission lines to the brain from a single set of color-brightness receiving elements in the eye.

Dr. Walls believes all the main facts of color vision and color blindness appear to fit into the branched pathways theory. Nor has he been able to find a single "special" case of congenital color blindness that cannot be explained on the basis of the theory he now proposes.

The scientist hopes the theory will serve to re-direct studies of color-blindness toward a full understanding of the color vision phenomena.

Science News Letter, September 4, 1954

PEDIATRICS

# Nursery School Helpful

➤ SCHOOL WILL soon be starting and even the five-year-old of the family will be off to kindergarten. In many homes, this leaves little sister or brother, aged two or three, home alone all morning or all day with no playmate except busy mother.

This child will feel both lonely and unhappy at being left out. Too often he waits all morning for big brother or sister to come back and play with him, only to find big brother or sister now wants to play with school mates and older children exclusively.

For the child in such circumstances, nursery school may be the answer, just as it often is for the only child and the child whose mother works out all day.

Some children at nursery school will learn to use crayons and paste, scissors and clay. But the chief thing they are likely to learn is how to get along with others, how to play and have fun as part of a group. This learning to be sociable is an important lesson for every child.

Youngsters in a large family with plenty of children at home and in the neighborhood may learn it without going to nursery school. Some mothers have the nack of making the back yard or the child's own room into an informal nursery school for the whole neighborhood.

If, however, you decide to send your small child to a nursery school, select one carefully. Visit it, preferably while it is in session. See whether it is clean and whether there are plenty of toys and play supplies and space to play.

Watch the children to see whether they look happy or whether they are scared and overly-quiet. Watch the teachers and talk to them to learn whether they seem to love and enjoy the children and have a way with them.

Check on whether the teachers have had real training for their jobs, and on how many children there are to each teacher. More than eight or 10 under-five-year-olds are hard for one person to handle, as any mother knows herself.

Science News Letter, September 4, 1954

PHYSICS

## A-Bomb Debris Confuses Dating

➤ ATOM BOMBS are mussing up the radioactive dating of the recent past. As a consequence, ancient Indian burials unearthed during building operations at University Village near Stanford University, Calif., are about 3,000 years old instead of 2,000 first reported.

Charcoal from the prehistoric graves was sent to Columbia University's Lamont Geological Observatory, Palisades, N. Y., where it was sprinkled by radioactive debris from an atomic bomb in Nevada, blown skyhigh and wafted across the continent.

Unaware of the contamination, Columbia reported to Prof. Bert A. Gerow of Stanford the 2,000-year age, which did not fit in well with the fact that they were in a lower earth layer than specimens believed to be over 2,000 years old. A retest showed the older age.

Dating by radiocarbon tells age by dying out of the radioactivity of the element carbon, formed by cosmic rays out of the upper air's nitrogen and incorporated in living things through the carbon dioxide of the air.

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